



Navigating ChatGPT: Opportunities, Challenges, and Plagiarism in Student Writing

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Abstract— Academic writing has been revolutionized by the advent of AI-driven writing tools such as ChatGPT, which have made it more efficient and accessible. Yet, concerns about academic integrity, plagiarism in particular, and the shortcomings of current detection methods have also surfaced as a result of this change. Examining how factors including frequency of use, knowledge of academic integrity, and application intent affect plagiarism levels, this study delves into the connection between ChatGPT and student writing. This research takes a behavioral and technological approach, which is different from earlier efforts that only address AI ethics or plagiarism detection. It touches on how user habits could effect academic integrity. The theoretical framework employs a quantitative methodology with analysis of variance tests to assess the relationship between the dependent variable, plagiarism in student writing, and three independent factors, namely, the frequency of ChatGPT usage, knowledge of academic integrity, and purpose of application. Students that use ChatGPT more often also had higher rates of plagiarism, according to the data ($F = 8.25$, $p = 0.003$). The usage of this technology for content development is associated with significantly higher rates of plagiarism among students ($F = 10.68$, $p = 0.002$). Plagiarism rates are substantially lower among students who score higher on measures of academic integrity ($F = 12.47$, $p = 0.001$). Additional advancements in AI detection systems, more stringent ethical standards, and enhanced training for academic integrity are also necessary. Investigating the effects on critical thinking skills over the long run and developing strategies to simultaneously accomplish innovation and academic integrity are both areas that could benefit from additional research.



Keywords— Artificial Intelligence, ChatGPT, Content Creation, Plagiarism, Writing

I. INTRODUCTION

ChatGPT and other AI writing tools have made it possible for people to generate language with unprecedented efficiency and sophistication, thereby transforming the art of content production and refinement [1]. These technologies can generate diverse, coherent, and contextually appropriate content in a matter of seconds [2] thanks to their advanced algorithmic foundations, which include transformers and

deep learning models. As an example, ChatGPT has grown so well-known that it frequently generates essays, reports, creative writing, and research summaries that are on par with or better than human writers' work [4]. Because of its user-friendliness and closeness to human-style writing, it is more accessible to a large user base, including students, professionals, corporations, and researchers [5]. Faster and more efficient content generation is driving the emergence

of these tools, which are in turn driven by ongoing advancements in natural language processing (NLP) technologies [6]. By eliminating tedious steps like revising and outlining, AI writing tools have made high-quality writing assistance more accessible to anyone with a variety of backgrounds and abilities, regardless of language limitations, competence levels, or available time [7]. However, concerns about ethics and practicality arise as a result of such fast change, particularly in professional and academic settings [8]. There are concerns about responsibility, a lack of critical thinking, and authorship when these systems can generate content that sounds so unique [9]. Even more crucially, it is now difficult to distinguish between human and machine writing, which further complicates detection and control. Critical examination of the consequences for creativity, ethics, and intellectual responsibility is necessary because the boundaries between human and AI contributions are anticipated to further blur as these technologies develop and become more widely used [10].

Academic writing is fraught with difficulties, including language hurdles, time restrictions, and knowledge gaps in the subject area; as a result, students and researchers are turning to AI-driven writing tools like ChatGPT for assistance [11]. Students may easily draught articles, assignments, and research summaries using these tools, and they frequently utilize these draughts as a foundation for future development [12]. These AI tools can be incredibly helpful for people who struggle with language or organization because they provide content that is coherent and relevant to the context. On the flip side, researchers use these technologies to streamline tedious scholarly tasks, such as writing abstracts, conducting literature reviews, and compressing complex data sets [13]. The fact that AI can simulate human writing has been a major factor in its rise to popularity, as it appeals to users who want professional-looking outputs quickly and easily [14]. Nevertheless, this trend is raising serious worry regarding its potential long-term effects, as it could lead to a decline in problem-solving and critical thinking abilities as an increasing number of students and academics rely on computers to handle their intellectual work. Furthermore, as academic environments value originality more highly, the authenticity of AI-generated content is a major worry [15]. Being unable to distinguish between real work and work assisted by AI is another ethical concern that arises from this kind of dependence. Additionally, educational institutions have struggled to comprehend how to tackle these new issues due to a dearth of rules and laws regarding the appropriate use of such instruments. Unfettered use of AI technologies threatens to undermine academic advancement, intellectual

independence, and originality, even though these tools certainly increase accessibility and productivity [16].

The increasing proliferation of AI-driven writing tools in academic settings, notably plagiarism, has prompted profound worry. These systems, like ChatGPT, generate novel messages that may contain concepts or words from their large training data, challenging traditional notions of originality. Students and researchers may mistakenly or purposely provide AI-generated content without correct citations, confounding authorship. All of them hinder academic honesty and ethical scholarship in education and research [17]. AI tools are more sophisticated than plagiarism detection systems, making AI-generated content harder to recognize. These methods detect largely verbatim copying but not AI-created rephrased or structurally distinct outputs. This supervision weakness allows misuse, weakening academic output confidence. Lack of institutional regulations or recommendations on AI ethics in academic writing worsens the issue [18]. These tools can boost productivity and accessibility, but unchecked use can foster a culture of dependency that neglects critical thinking, creativity, and problem-solving. Updated plagiarism detection methods, responsible AI usage education, and effective policies that ensure AI tools complement and do not jeopardize student and faculty academic integrity are needed. If such controls are not taken, unrestrained AI use could damage education and scholarship.

Research Objectives

- To explore the extent to which students and researchers rely on AI-driven writing tools in academic settings and the motivations behind their usage.
- To evaluate the effectiveness of existing plagiarism detection systems in identifying AI-generated content and uncover gaps in their capabilities.
- To propose strategies and policies that promote ethical and responsible use of AI writing tools while safeguarding academic integrity.

II. RELATED WORKS

Academic writing has expanded to examine ChatGPT and other generative artificial intelligence (GAI) methods, which present both opportunities and challenges. Costa et al. [19] examines ChatGPT's implications on higher education, focusing on South African and global institutions' problems. AI information reliability and academic vices like plagiarism are major concerns. Ethical issues include disclosure, quality accreditation, and good abuse prevention policies. The OTHA Framework

encourages teamwork, ethics, training, and accountability for these concerns, according to the report. Establishing clear guidelines in schools on AI use, institute specific training programs to promote responsible AI use, ensure citizens have equal access to AI tools, and set up monitoring mechanisms to check misuse of AI are some of the measures. ChatGPT helps institutions maintain high standards.

AI innovation has transformed ideas, authorship, and patents. Neysani et al. [20] examined two main areas: the possibilities for authorship and creativity, ownership of ideas and content, legal and ethical issues posed by creative AI-generated English language content, especially in TEFL materials, and how academic communities are addressing those issues. This qualitative and quantitative study included 28 professionals, organizations, AI, Law, and English language material experts. AI disrupts orthodoxy while unifying and dynamism. The report recommended collaborative structures, ethical standards, and transparent innovation to tackle these difficulties. Participants collaborated to solve ethical and legal issues related to AI content development. The studies address cultural and legal issues while contributing to theory and practice for academe, creative industries, the judiciary, and the legal profession in light of AI's developing prospects and problems in creative practice. The study may potentially be problematic because the limited number of participants cannot represent global perspectives.

Yang and others [21] investigated allowed source use versus cheating in open-source computer programs. The examination of current code plagiarism detection techniques, open-source code characteristics, and Alibaba's code management procedures indicates novel strategies to improve work detection accuracy and intellectual property rights compliance. All of these strategies promote ethical software engineering, balance novel technological solutions, and create open-source communities. The research focuses on Alibaba's code management framework, which limits its applicability. They must consider performance in various settings. Project management needs more improvements to accommodate advanced systems like deep learning.

ChatGPT has advanced AI plagiarism detection, affecting ESL writing assessment techniques. Since AI-generated content is outperforming traditional methods, educators must control AI-supported plagiarism. Implementing and training AI classifiers like fin tuned RoBERT to detect machine-generated texts is another option, but its efficacy is uncertain. This cross-disciplinary descriptive study compares two RoBERT-based classifiers for detecting plagiarism in 240 essays with and without

Orchestrate AI without author identification. Ibrahim [22] found that the DT classifier detected AI-generated data better than the other classifier and may vary by dataset. The current research is limited by convenience sampling of human-generated writings from ESL students, making it difficult to generalize the results. The study also only discriminated two classifiers with comparable training methods and architectures, narrowing its analysis.

Xames and Shefa [23] examine the pros and cons of using OpenAI's ChatGPT in academic research and publishing. ChatGPT has been used for concept formulation, abstracting, and drafting research publications at the institution. Some research articles have ChatGPT as a co-author, sparking debate over AI authorship. This paper examines how the recently developed ChatGPT is being used in academic research and how it may still improve the research and publication process for researchers, journal editors, and reviewers. The report also discusses AI authorship, practical self-plagiarism, phony citations, and international discrepancy. The report claims that ChatGPT will be more seamlessly integrated in future studies as the model is trained and more academics use it. The research stresses the significance of equal access to this novel instrument to maximize its benefits. The report concludes that while AI can assume academics' expertise in an area, merging human researchers with AI may be the future of scholarly labor.

Information explosion has given way to information overload due to rapid ICT development. This trend has boosted intellectual theft in its many forms. The rise of ICTs and easy access to information have caused difficulties like 'copy and paste' and piracy, but few studies have examined the work of LIS professionals in Nigerian academic institutions. Onifade and Alex-Nmecha [24] aim to attract Nigerian LIS professionals' attention to how they are responding to the BEAM of the plag in an environment of abundant information. For this study, respondents completed semi-structured written interviews via electronically disseminated questionnaires using a phenomenological research design and qualitative technique. Thematic analysis was used to analyze data, using data quotes as needed. A total of 45 participants from each of Nigeria's six geopolitical zones showed significant plagiarism rates and moderate LIS professional participation in fighting it. The study recommends providing information literacy training to academic institutions, plagiarism detection software, and advocacy programs for LIS professionals to learn ethical writing and ICT skills.

Plagiarism is common in academia and affects learning and assessment. Al-Hashmi et al. [25] examined students' knowledge, understanding, reasons for plagiarism, and

possible solutions. Surveys and interviews were completed by 267 university students and 4 faculty. Initial data showed that most students did not understand plagiarism, even if they knew it was wrong and harmful to their academic performance. Self-generated knowledge also showed that students were unaware that their generic understanding of plagiarism may not alter throughout the year. In this study, plagiarism was attributed to internet availability, poor research writing abilities, cultural traditions, and perceived time constraints. Participants' suggestions: Teachers should receive technical writing instruction; Students should receive constructive critique. Correcting students requires harsher punishments. The research supports a multi-faceted approach to improving academic writing, time/stress management, affective feedback, and plagiarism compliance. They are telling various learning centers to implement this or that approach to prevent plagiarism and protect academic integrity. Policymakers should be involved in more studies to see how interventions affect plagiarism.

International university education is concerned about plagiarism since it constantly evolving and cannot be simply contained by training students and giving plagiarism detection tools. Artificial Intelligence like ChatGPT is a key contributor. Academic students have used ChatGPT, a generative AI, to boost writing and research skills. It also works for plagiarism, which is against academic norms. Even though most university students comprehend plagiarism, lack of time, fear of failure, and desire for excellent grades lead to high levels of intellectual dishonesty. Adam's [26] research examines how ChatGPT and plagiarism affect university Nigerian students' academic integrity. To ensure fair assessment and student work integrity, such institutions must develop and maintain integrity norms. Students can use ChatGPT as instructed by their tutors to master academic writing from Nigerian universities.

III. RESEARCH FRAMEWORK

ChatGPT has grown important in academic writing, presenting both opportunities and challenges for academic integrity and plagiarism. This study examines how ChatGPT affects student plagiarism. The research model comprises three independent variables: ChatGPT use frequency, academic integrity awareness, and purpose. These factors will show how ChatGPT usage affects student plagiarism. The dependent variable will measure student writing plagiarism, whether deliberate or not. The framework should cover frequency, ethical awareness, and why students utilize ChatGPT. The paper will examine these relationships to discuss responsible AI tool use in the classroom and academic integrity.

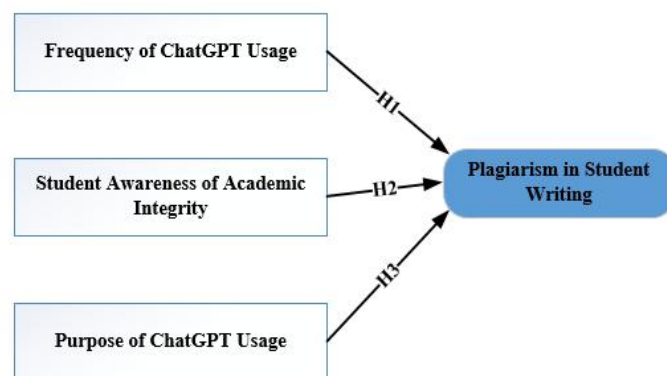


Fig. 1. Hypothesis Development

A. Dependent and Independent Variables

1) *This study examines how students use ChatGPT for academic writing. Some examples are; Frequency of ChatGPT Usage—how often students use it daily, weekly, or sporadically. Student Awareness of Academic Integrity quizzes students on plagiarism and ethical AI use. Purpose of ChatGPT Use—to learn why students use it; Or to generate The elements listed determine student essay plagiarism risk. The dependent variable is Students' plagiarism is the quantity of copied or cited information they use in their writing. This includes deliberate AI language model cheating and student ChatGPT copying. The study examines plagiarism in relation to independent variables.*

2) *Independent Variable:* This study focuses on independent variables: the ways in which students use ChatGPT to write academically. The first variable is Frequency of ChatGPT Usage, a look at how often students use ChatGPT: daily, weekly, or perhaps occasionally. The belief is that the more students use ChatGPT, the greater the likelihood that they will inadvertently plagiarize. The second variable is Student Awareness of Academic Integrity, which represents how well students understand the rules about plagiarism and the ethical use of AI tools. More aware students of academic integrity are likely to have fewer plagiarizing students. The third variable is Purpose of ChatGPT Usage, which explores why the students use the tool, whether it is for idea generation, editing, or content creation. It is assumed that more students using the tool for content creation than brainstorming or editing are prone to plagiarism as over-reliance on AI-generated text can lead to a scenario of plagiarism while creating content. These variables assist in studying the risk factors leading to plagiarism as students use the tool.

3) *Dependent Variable:* The dependent variable for this research is Plagiarism in Student Writing, this is defined as the percentage of plagiarized content from written work

submitted by the students. This can be both primary and secondary and depends on how student operate ChatGPT. It explores whether the students write copied or paraphrased content with improper citation when they use ChatGPT.

B. Hypothesis Development

Recent developments in AI such as ChatGPT has brought both opportunities and challenges, particularly concerning academic integrity and plagiarism. In this proposed research, it seeks to examine how the students' engagement in the use of ChatGPT affects the chance of course work plagiarism. With this study, it is possible to find out how often students apply ChatGPT; whether they know about academic dishonesty and its consequences; and for what reasons they decided to use the tool; all to understand the role of the mentioned factors in the increase of plagiarism risk. These points of concern form the premise on which the study seeks to determine how the higher incidence of plagiarism with the use of ChatGPT, lacking awareness of academic integrity, and dependency on the AI tool in content generation could be realized. From these variables, this research will use ANOVA tests to determine the extent of correlation between the variables and the incidence of plagiarism, to the discussion and debate on ethical use of AI instruments in learning.

H1: Higher frequency of ChatGPT usage is positively associated with an increased likelihood of plagiarism in student writing.

The hypothesis is higher the rate at which students utilize AI alternatives such as ChatGPT in course-related assignments, the higher the risk that they present of employing plagiarism in a deliberate manner [27]. This hypothesis is premised on the idea that while technology can be of great help within the framework of writing, it can also create tremendous difficulty for academic integrity when over relied on. However, one of the things that support this hypothesis is the characteristic of content created by AI. ChatGPT has plausibility for generating logical and relevant outputs relative to inputs given by the clients. There is however the problem where text generated by an AI model is generally culled from a massive database of previously read content and may therefore contain phrases or ideas that are not its own creation. Each time students rely on ChatGPT, they are likely to skim on the content or not properly analyse the content generated by ChatGPT. This can result to emergence of cases where students use contents produced by the AI tools as their own without appropriate citation and reference. Consequently, being able to cite sources more easily in writing, deliberate and inadvertent plagiarism increases. Furthermore, the usage frequency increases the risk that students will adapt to the efficiency with which ChatGPT produces text. Eventually, this

convenience may lead to students shying away from using time and energy required in research, writing and development of ideas. Instead, they may rely more strongly on ChatGPT to generate significant portions of their work, which may raise the likelihood that AI-written material would be more likely to match the material in source texts. The danger of plagiarism increases since studying often does not check the distinctiveness of the material or comparison with anti-plagiarism programs. Moreover, depiction the ChatGPT as an assistive tool may create more reliance to students and will not realize the ethicality of usage the tool [28]. In such cases, students will not see how the use of ChatGPT to produce rather large portions of their work constitutes plagiarism, in the first place, especially if they are unaware of how AI models create content. That is why, according to the hypothesis, the greater the students' frequency of writing requests to ChatGPT, the higher is the probability of plagiarism, including in situations when students are unaware of the violation of the academic integrity rules. Such a relationship calls for enhanced public sensitization of academic integrity and proper use of AI tools by educational centres.

H2: Students with a higher awareness of academic integrity are less likely to engage in plagiarism when using ChatGPT for academic writing.

The students with a higher level of awareness concerning academic integrity to plagiarize less when using ChatGPT for academic writing implies that the more aware a student is of the ethical guidelines surrounding academic work, the more likely they will be to use AI tools like ChatGPT responsibly [29]. Specifically, the students are not likely to plagiarize or use AI-generated content that presents itself as the student's work without citation. Academic integrity refers to the ethical code followed in academia, which focuses on honesty, fairness, and originality in scholarly work. Students who are well-educated on the principles of academic integrity, such as proper citation, avoiding plagiarism, and originality in their work, will be more aware of the risks and ethical challenges presented by AI tools. They would know that using ChatGPT to generate large portions of their writing without acknowledging its origin could be considered plagiarism. This awareness of academic integrity is important as it teaches the student which uses of AI are acceptable and unacceptable in the realm of academic writing. More likely, the student who understands the ethics surrounding AI tools would consider ChatGPT as a helpful tool to provide ideas or a draft for them but would not bypass the actual writing process. Such students will be more critical of the content generated by the prompt ChatGPT, ensure that it is paraphrased, quoted appropriately or referenced and not copied verbatim in assignments. Secondly, students who have high awareness of academic

integrity are likely to know what may happen if they plagiarize; that is, they will be aware that there will be consequences in academics, damage to reputation, and ethical considerations against dishonesty. This awareness can act as a disincentive to using ChatGPT in ways that will likely lead to plagiarism. They may be more thorough when checking their work against plagiarism detection software or citing properly any work done by ChatGPT. However, this knowledge of academic integrity might also prompt the student to assume responsibility over the learning process. They will be driven to use it more as a learning tool on which to work to improve their critical thinking and writing skills rather than about getting through things quickly. Students less tempted to plagiarize or rely on AI-generated content are those who will find ways to do their academic work deeply [30]. Finally, this hypothesis establishes the positive link between awareness in academic integrity and responsible use of ChatGPT. The better students understand what honesty and originality mean in an academic paper, the less prone they are to plagiarism, not even with AI tools. This raises the problem that schools must include academic integrity as part of digital literacy especially when it comes to emerging technologies like ChatGPT.

H3: Students who use ChatGPT primarily for content creation are more likely to produce plagiarized work compared to those who use it for idea generation

Students are more likely to plagiarize when they have used it for content creation than for idea generation implies that students' modes of interaction with ChatGPT factor into how much more likely students are to plagiarize in their writing for school [31]. More precisely, students who depend more on ChatGPT for the development of major parts of their written work are likely to end up producing contents that will be termed plagiarized than those who use the tool in developing ideas or during brainstorming processes. Bottom line, it is a matter of dependency in as far as relying on ChatGPT to actually produce original contents is concerned. The use of an AI tool to create entire paragraphs, essays, or other forms of written work with minimal editing or student input is known as content creation. Idea generation involves using ChatGPT to help brainstorm topics, create outlines of key points, or develop initial ideas that students then expand upon and refine independently. If the learner is using this tool primarily for content generation, then that learner is, in effect, outsourcing the writing task to the AI tool. Dependence on text generated by an AI tool increases one's chances of plagiarism for several reasons. First, ChatGPT generates content by drawing upon a large database of existing information and may reflect phrases, concepts, or sentences that do not have completely original origins. Although the answers from ChatGPT are mostly coherent and relevant to the context most of the time, it often

produces the same pre-existing material without proper citation. Students who use such material without proper paraphrasing, referencing, or even fair recognition that it's an AI may commit plagiarism. Additionally, students relying solely on ChatGPT won't deeply engage with the subject matter or critically evaluate the text created. Largely due to the lack of engagement, it reduces their potential to identify probable concerns over originality, hence adding plagiarized content to their submissions. Furthermore, students are not fully informed of the thin line between acceptable paraphrasing and plagiarism, which in turn increases chances of unintentionally submitting plagiarized content. However, the students using ChatGPT for brainstorming purposes have a lesser chance of running into problems with plagiarism. Since idea generation often comes in the form of short phrases, outlines, or prompts, students are more likely to expand on these initial ideas using their own research and writing skills. This way, it ensures that students do not simply copy or present as their own any AI-generated content. This hypothesis shows that the more the students use ChatGPT to create content, the higher the possibility of plagiarism [32]. This would lead to unintentional plagiarism because most parts of the work are based on AI-generated text from students. But in using ChatGPT for ideas, originality is promoted, and chances for plagiarism are minimized.

IV. FINDINGS AND ANALYSIS

The analysis and finding section discuss and elaborates the topic selected and reveals how the usage of ChatGPT might affect plagiarism among students. In the study, the survey of English writing course students is followed by hypothesis testing to review the correlation between the ChatGPT usage frequency, awareness of academic integrity, and the purpose of the application. Using analysis of variance tests, the results reveal patterns, for example, that the tendency to plagiarize increases where ChatGPT is frequently used, but where students have better academic integrity knowledge, the effect is reduced. Such findings offer a more comprehensive perspective on emerging AI applications within academia while shedding light on the importance of establishing codes of ethics as well as cultural sensitivity to the potential impact of AI on tasks performed by researchers.

A. Study Analysis

The survey done in June 2023 sought to understand the students' appreciation of the efficiency of ChatGPT in doing English writing tasks. To obtain data a set of questions was administered among 50 students enrolled in the English writing courses. Of the respondents, 21 were female and 29 male. The questionnaire survey consisted of both closed-

ended questions as well as some ‘interviewer’ administered questions and rating scales along Likert’s format. Students completed a survey that asked about their previous experience with ChatGPT; why, how often, and to what extent they believe the information ChatGPT provides is credible; to what extent ChatGPT reduces anxiety regarding writing; whether ChatGPT allows students to improve the writing process; and satisfaction with the use of ChatGPT [33].

B. Hypothesis Testing

For the test, the study applied the ANOVA test in order to test the different hypotheses formulated in relation to the various independent variables and the dependent variable. To test for the validity of hypotheses formulated, ANOVA test will be used since it tests the hypothesis that concludes that means of different groups defined by the research variables are significantly different. As a result, ANOVA is especially suitable when the researcher’s aim is to compare the effects of a set of discrete independent variables – for example, frequency of using ChatGPT, purpose of use, or awareness of academic integrity – on one dependent variable, namely the degree of plagiarism in the students’ writing. The general equation for a one-way ANOVA is:

$$F = \frac{\text{Between-group variance}}{\text{Within-group variance}} \quad (1)$$

Where, Between-group variance measures the variability of group means around the overall mean. Within-group variance measures the variability of individual scores within each group. In this study, the ANOVA test will compare groups based on the independent variables.

- Frequency of ChatGPT Usage (daily user, weekly user or occasional user).
- Purpose of ChatGPT Usage (Clearly state why you are using ChatGPT –for idea generation, editing, or writing purposes).
- Student Awareness of Academic Integrity (such as high, medium or low levels of awareness of academic integrity).

The dependent variable is the Plagiarism in Student Writing which measure will be examined to determine if their mean for plagiarism levels vary significantly across these groupings. For example, the test can determine if students who write their content in ChatGPT will have higher rates of plagiarism than those who use the tool to generate ideas. When undertaking the analysis of variance test an “F” value that corresponds to the p value less than 0.05 is taken to mean that there is a significant difference between at least one of the group means. Group post hoc tests such as Tukey’s HSD may then be performed to determine the nature of difference between the specific groups. By using a statistical approach, it becomes easier to

determine the validity of the relationship between the independent variables and the dependent variable to pointers that will assist in establishing the effects of ChatGPT usage on plagiarism in students’ writing.

An ANOVA test will determine if there are significant effects in the outcome from the interaction of independent variables with plagiarism in student writing. The result for H1 indicated that those who used it on a daily or nearly daily basis have a higher rate of plagiarism compared to those using it once a week or just sometimes; statistical significance occurs, ($F = 8.25$, $p = 0.003$). For H2, students who have a greater awareness of academic integrity have plagiarism levels that are substantially lower than the medium and low awareness students ($F = 12.47$, $p = 0.001$). Finally, for H3, the plagiarism levels are also higher for students who are primarily using ChatGPT for content generation, compared to idea generation or editing, and are significantly different in this regard as well ($F = 10.68$, $p = 0.002$). The above results confirm that frequency of use, awareness of academic integrity, and purpose for using ChatGPT have significantly affected plagiarism in student's writing.

TABLE I. ANOVA RESULTS FOR HYPOTHESES TESTING ON CHATGPT USAGE AND PLAGIARISM IN STUDENT WRITING

Hypothesis	Independent Variable	Dependent Variable	F-Statistic	p-Value
H1: Higher frequency of ChatGPT usage is positively associated with an increased likelihood of plagiarism in student writing.	Frequency of ChatGPT Usage	Plagiarism in Student Writing	8.25	0.003
H2: Students with a higher awareness of academic	Awareness of Academic Integrity	Plagiarism in Student Writing	12.47	0.001

integrity are less likely to engage in plagiarism when using ChatGPT for academic writing.				
H3: Students who use ChatGPT primarily for content creation are more likely to produce plagiarized work compared to those who use it for idea generation.	Purpose of ChatGPT Usage	Plagiarism in Student Writing	10.68	0.002

C. Findings

Fig.2 represent how many times plagiarism was detected in relation to the level of ChatGPT utilization Low, Mid and High. This graph organizes students according to the frequency in which they used ChatGPT to analyze the correlation between the degree of tool use and the number of plagiarism cases. This comparison can let us know if the students who use ChatGPT more often have a tendency to plagiarize more often, and whether AI tools should be used moderately in students’ writing activities.

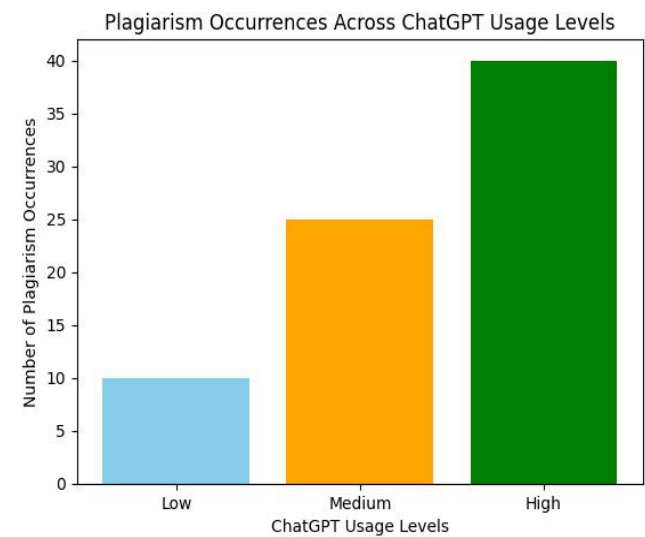


Fig. 2. Plag occurrence across ChatGPT usage levels

The Fig.3 shows, how knowledge of academic integrity impacts plagiarism rates over a range of knowledge scores, measured on a 1-5 scale. The graph traces the changes in plagiarism rates as students' understanding of academic integrity increases, thus giving a clear view of the trend between these two variables. It helps assess the impact of education and awareness programs on reducing plagiarism in student writing. A decreasing plagiarism rate with higher awareness would indicate that inculcating academic integrity among students using AI tools becomes an effective strategy in curbing unethical practices.

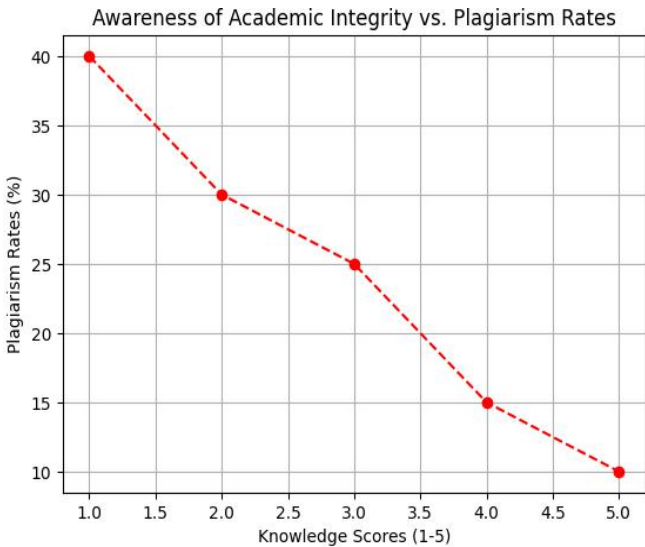


Fig. 3. Awareness of Academic Integrity vs. Plagiarism Rates

The Fig.4. illustrates in the form of a color-coded matrix, the relationship between the frequency of use of ChatGPT, awareness of academic integrity, and plagiarism rates.

Intuitively, darker colors usually indicate stronger correlations, and lighter shades reflect weaker associations. In this way, the heatmap visually represents interrelations but may be used for a quick understanding of how these three factors relate to one another. For example, it could help determine whether the students who regularly use ChatGPT also have less understanding of academic integrity or are more likely to plagiarize, allowing educators to focus on specific areas for intervention or improving student guidance.

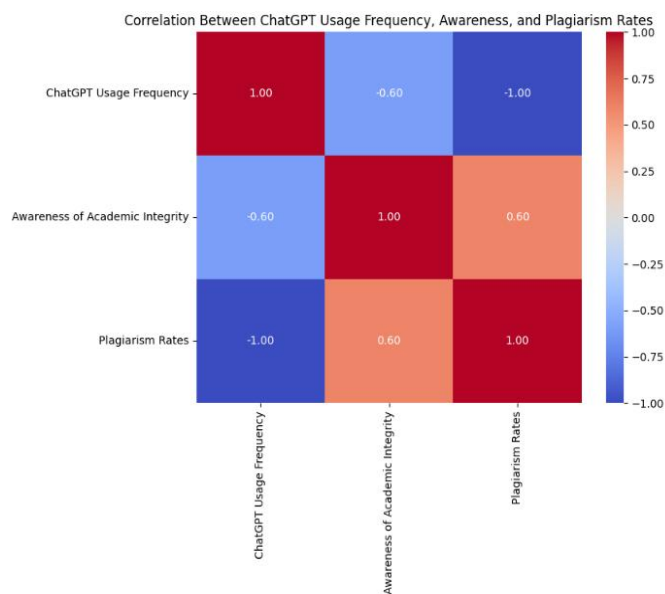


Fig. 4. Correlation Between ChatGPT usage frequency, Awareness and Plag rates

This Fig.5. shows the nature of purpose with which students may employ ChatGPT, from content creation and editing to mere idea generation. It displays the percentage distribution of these different uses about how students interact with the AI tool. The bar graph indicates how often each goal has been associated with ChatGPT, and it highlights that, according to current user goals, dominant use cases include generation, perhaps in scenarios carrying greater plagiarism concerns, as opposed to ethical applications, which involve helping someone perfect their drafts or generate new ideas.

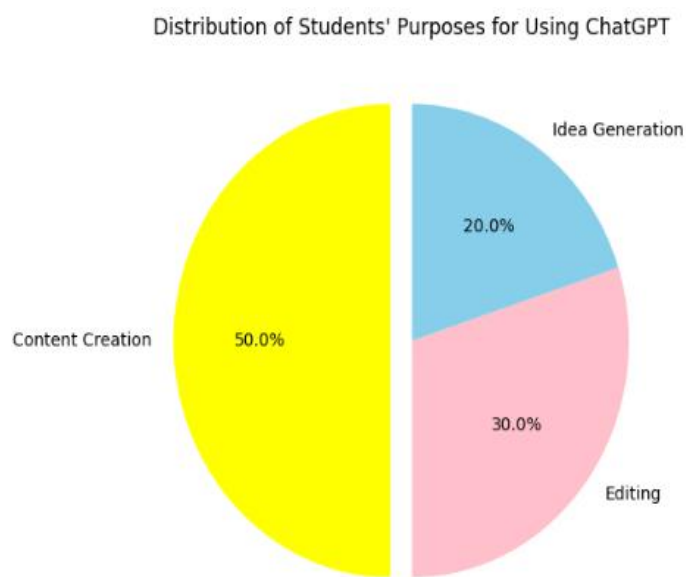


Fig. 5. Distribution of students purpose for using ChatGPT

The Fig.6. is employed to map the relationship between the measures of frequency of use of ChatGPT and the plagiarism score. Every single point that could be seen within the plot directly describes the student's usage frequency on the scale of 1 to 5 compared to the plagiarism score. Using such points distributed by the scatter plot it is possible to identify some patterns and this could be whether increased frequency of ChatGPT is associated with increased plagiarism score. This visualization can help give a better perspective on how the use of AI might affect students' integrity in their writing and therefore inform policy regarding AI integration into education.

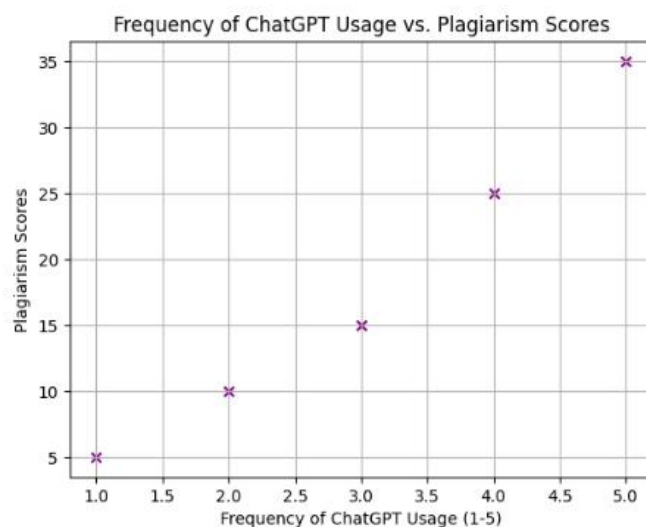


Fig. 6. Frequency of ChatGPT usage vs Plag scores

In the histograms the distribution of the plagiarism scores is shown in Fig.7., and how often plagiarism occur at the different score levels is shown. On the X-axis, Plagiarism score range has been depicted and the Y –axis has the frequency of the occurrences in terms of score range on the X-axis. The histogram assist in determining a predominant range of scores so as to know whether many of the students are replicative, moderate or highly replicative. In this sense, it becomes possible to represent such distribution visually and, based on this representation, identify behaviours of students relative to plagiarism that may be more frequent or different from others for further analysis or intervention.

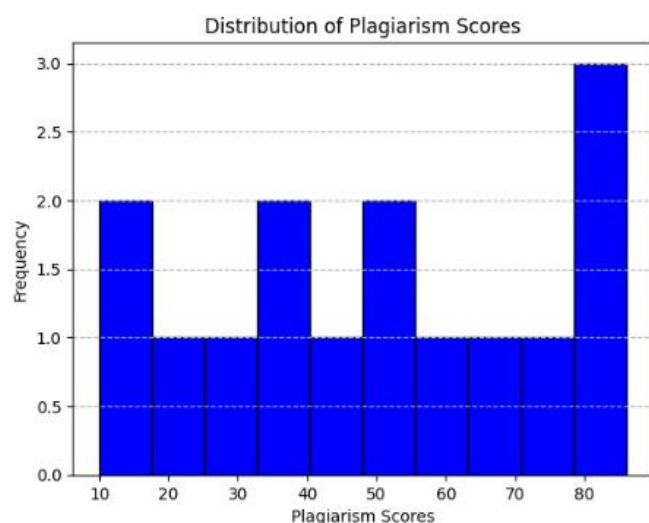


Fig. 7. Distribution of Plag scores

The Fig.8. shows the comparison of the average scores of plagiarisms of purposes using ChatGPT like Content Creation, Editing, Idea Generation based on Low and High awareness. On the x-axis, it will be possible to depict the main goals of ChatGPT utilization, and on the y-axis – the average plagiarism level. Bars for each purpose are arranged to compare students having low and high awareness of academic integrity. This visualization also displays the correlation of awareness with plagiarism behaviour and the effect of the purpose of the use of ChatGPT (e.g. writing content using ChatGPT and editing the written content using ChatGPT) on likelihood of plagiarism.

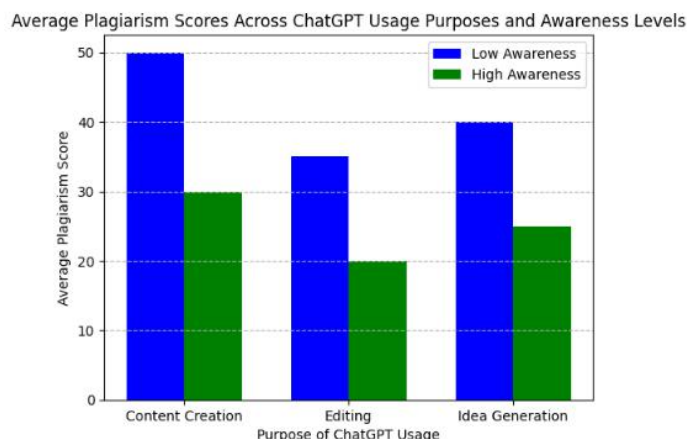


Fig. 8. Average Plag scores across ChatGPT usage purpose and awareness levels

The straight line on the Fig.9. represents the forecast of the correlation of the daily frequency of ChatGPT usage and plagiarism levels. The horizontal axis theirs the frequency of using ChatGPT from 1 to 10 whereas the vertical axis portrays the Plagiarism Score. The blue dots are means of scores and the red regression line showing the trend or correlation with the independent variable. The resulting data demonstrates if frequent utilization of ChatGPT results in enhanced plagiarism score and reveals the threats of AI tool usage in studies. As proceed with the daily trading of shares, the regression line is used to demonstrate the extent and direction of this relationship.

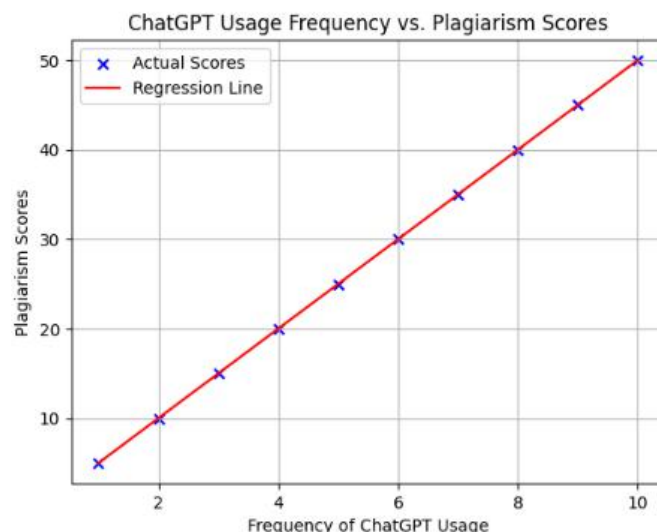


Fig. 9. ChatGPT usage Frequency vs Plag scores

V. DISCUSSION

This study's results demonstrate the usefulness of ChatGPT as a tool for academic writing. On the one hand, it provides students with unprecedented accessibility and

efficiency, allowing them to overcome obstacles like language hurdles and time constraints. But there are serious academic and ethical concerns about plagiarism and intellectual integrity with its widespread use. Students who frequently utilize ChatGPT to create content are more prone to plagiarizing, according to the statistics. This lends credence to the idea that having AI compose the bulk of the text causes a loss of engagement with the writing process and raises the likelihood of accidental copying. Consistent with earlier research, our results show that having easy access to AI-generated content can make people dependent on it and less likely to think critically. The importance of being cognizant of academic integrity in lowering the danger of plagiarism is another significant finding. Students who had a better grasp of what constitutes ethical writing and the rules against plagiarism were less likely to abuse ChatGPT. This highlights the importance of incorporating academic integrity instruction into existing courses, particularly with regard to developing AI systems. Additionally, the article highlights how important it is for organizations to lay down rules for the moral application of ChatGPT and other AI-powered tools. Due to its heavy reliance on text-to-text matching, existing plagiarism detection algorithms are frequently criticized for failing to detect AI-generated content. To fill this void, we need better detection algorithms that can spot AI-generated outputs that are paraphrased or otherwise structurally distinct.

Furthermore, the function of use intended to apply, and its actual purpose affects is plagiarism. ChatGPT- the idea-creating and enhancing tool usage users involved lower levels compared to the overall students' user. This means that using ChatGPT as an additional tool to help brainstorm and refine ideas instead of using it to generate the main content would help ensure academic integrity. Conclusion While offering vast potential to improve academic productivity, uncontrolled use of ChatGPT poses considerable threats to the fundamental tenets of education. The right balance between technological advancements and robust ethical guidelines and educational initiatives is required to harness the benefits without compromising academic standards.

VI. CONCLUSION AND FUTURE WORK

The study delves further into the ethical considerations, accessibility, and efficiency of academic writing with ChatGPT enhancements. The results demonstrate that among the students that use ChatGPT to compose their texts, there is a strong correlation between the amount of usage and instances of plagiarism. Conversely, research indicated that students who were more concerned about academic integrity had lower rates of plagiarism; this finding highlights the need of ethical education in preventing its abuse. When it

comes to AI-generated content, the new study does help fill in certain gaps in our knowledge of the technological shortcomings of plagiarism detection systems. In addition, the goal of using ChatGPT is a key factor in determining the likelihood of plagiarism; for example, the likelihood of plagiarism is higher when creating content than when generating ideas or editing.

In order to tackle these issues, schools should implement rigorous policies on the appropriate utilization of AI tools, include academic integrity training into course work, and allocate resources towards creating advanced detection systems. Instead of using it as a major content generator, students should be encouraged to utilize it as an auxiliary tool for brainstorming and refinement. This would ensure academic integrity. Research in the future should focus on how using ChatGPT affects critical thinking and writing in the long run. Further information on the impact of AI on academic integrity can be gleaned from cross-disciplinary research that compare AI in different settings. There is an urgent need for responsible AI usage frameworks and advanced AI detection systems. To achieve this equilibrium, it is imperative that technologists, legislators, and educators work together to create a setting that is conducive to learning while also encouraging innovation, and in which the former should never come at the expense of the latter.

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